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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR     | ATTORNEY DOCKET NO.          | CONFIRMATION NO. |
|--|-------------|--------------------------|------------------------------|------------------|
| 10/608,935   | 06/27/2003  | Nicholas Grant Rasmussen | 20567-023001                 | 6976             |
| 20985  | 7590        | 01/25/2007               |                              |                  |
| FISH & RICHARDSON, PC<br>P.O. BOX 1022<br>MINNEAPOLIS, MN 55440-1022 |             |                          | EXAMINER<br>GUILL, RUSSELL L |                  |
|  |             |                          | ART UNIT                     | PAPER NUMBER     |
|  |             |                          | 2123                         |                  |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS                               | 01/25/2007 | PAPER         |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/608,935

Applicant(s)

RASMUSSEN ET AL.

Examiner

Russ Guill

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/28/2007</u>  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This Office Action is in response to an Amendment filed December 28, 2006. Claims 1 – 4 are pending. Claims 1 – 4 have been examined. Claims 1 – 4 have been rejected.
2. **The Examiner would like to thank the Applicant for the well-presented response, which was useful in the examination process. The Examiner appreciates the effort to carefully analyze the Office Action, and make appropriate arguments and amendments.**

### *Response to Remarks*

3. Regarding the Information Disclosure Statement (IDS):
  - a. The IDS has been signed, and is returned with this Office Action. However, the entries in the IDS are missing a date, and are therefore invalid entries (MPEP 609, 37 VFR 1.98). The missing dates will cause the application to be returned to the Examiner for correction at the time of allowance.
4. Regarding claim 2 objected to for minor informalities:
  - a. Applicant's amendment overcomes the objection.
5. Regarding claims 1 – 4 rejected under 35 USC § 101:
  - a. Applicant's arguments and amendments have been fully considered, but are not persuasive. Please refer to the new rejections below for an explanation.
6. Regarding claims 1 and 4 rejected under 35 USC § 102:
  - a. Applicant's arguments have been fully considered, and are persuasive.
7. Regarding claims 2 and 3 rejected under 35 USC § 103:
  - a. Applicant's arguments have been fully considered, and are persuasive.

***Information Disclosure Statement***

8. The information disclosure statement filed December 28, 2006, fails to comply with the provisions of 37.CFR 1.97, 1.98 and MPEP § 609 because all references must have a month and year. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

***Claim Rejections - 35 USC § 101***

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. **Claims 1 – 4** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

a. Regarding **claim 1**, the claim does not appear to produce a useful and tangible result to form the basis of a practical application needed to be statutory. The claim appears to have two issues. First, the claim recites, “for rendering by a computing device”. This phrase appears to define a functional limitation, but the rendering action does not actually occur. Second, rendering does not appear to necessarily be tangible; it does not necessarily require that a rendered image be displayed or stored. Rendering appears to be a process of using a model to generate data in a format for display, but does not appear to necessarily perform the display.

b. Regarding **claims 2 - 3**, the claims do not appear to produce a useful and tangible result to form the basis of a practical application needed to be statutory. The claim

appears to have at least two issues. First, the claim recites, “to simulate movement of the element for rendering by a computing device”. This phrase appears to define a functional limitation, but the rendering action does not actually occur. Second, rendering does not appear to necessarily be tangible; it does not necessarily require that the rendered image be displayed.

c. Regarding **claim 4**, the claim appears to include abstract operations such as advecting a plurality of elements. Therefore, to be statutory, the apparatus must have a practical application having a useful, tangible and concrete result. The claim does not appear to produce a useful and tangible result to form the basis of a practical application needed to be statutory. Advecting simulated elements through simulated 3D space does not appear to be a tangible result.

*Allowable Subject Matter*

11. Claims 1 – 4 are allowable over the prior art of record.

12. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

13. Following is a statement of reasons for the indication allowable subject matter:

14. While Fedkiw (“Visual Simulation of Smoke”, 2001) teaches generating a plurality of 2D grids, each grid having a plurality of grid point; associating movement information with each 2D grid point; changing the movement information associated with the 2D grid points over a time period that includes discrete intervals; defining a region of 3D space using the 2D grids, neither

Fedkiw alone or in combination with the prior art of record teaches a method of simulating movement of a plurality of elements through space, specifically including:

- a. Regarding **claim 1**: “advecting the plurality of elements through the region of 3D space using the movement information associated with the 2D grids for rendering by a computing device”,

in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant’s invention defines over the prior art of record.

15. While Fedkiw (“Visual Simulation of Smoke”, 2001) teaches generating a plurality of 2D grids, each 2D grid having a plurality of grid points, each grid point having movement information; defining a region of 3D space using 2D grids; generating a plurality of elements in the region of 3D space, each element having a location, and Wyvill (“Animating Soft Objects”, 1986) teaches interpolating between the movement information of points, neither of these references taken either alone or in combination with the prior art of record teaches a method of simulating elements advecting through space, specifically including:

- a. Regarding **claim 2**: “for each element, determining movement information for an element based on the location of the element in the region of 3D space wherein the determination includes: identifying points on the 2D grids that lie on both sides of the element at the location in the region of 3D space; determining movement information at the points on the 2D grids; and interpolating between the movement information at the points on the 2D grids to determine element movement information for the element at the location in 3D space to simulate movement of the element for rendering by a computing device”,

in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant’s invention defines over the prior art of record.

16. While Fedkiw (“Visual Simulation of Smoke”, 2001) teaches a computing device to generate a plurality of 2D grids, each 2D grid having a plurality of grid points, movement information is associated with each 2D grid point, wherein the movement information associated with the 2D grid points of the 2D grids changes over a time period that includes discrete intervals, the

computing device also defines a region of 3D space using the 2D grids, neither Fedkiw alone or in combination with the prior art of record teaches an apparatus for simulating movement of a plurality of elements through space, specifically including:

a. Regarding claim 4: “advects the plurality of elements through the region of 3D space using movement information associated with the 2D grids”,  
in combination with the remaining features and elements of the claimed invention. It is for these reasons that the Applicant’s invention defines over the prior art of record.

17. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

#### *Conclusion*

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

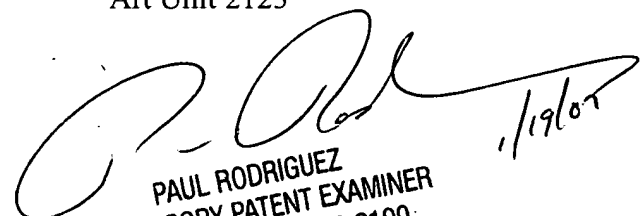
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday – Friday 9:30 AM – 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG

Russ Guill  
Examiner  
Art Unit 2123

  
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SUPERVISORY PATENT EXAMINER  
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1/19/07